Cholera among Belgian travellers in Turkey in 2005

Koen De Schrijver, Hilde Boeckx, Geert Top, An Mertens, Patrick De Mol

Health Inspectorate, Department of Epidemiology and Social Medicine, Ministry of the Flemish Community, University of Antwerp, Copernicuslaan 1 2018 Antwerp, Belgium

Department of Microbiology, Middelheim Hospital, ZNA, Antwerp, Belgium

Reference Laboratory of Cholera in Belgium, Centre Médical Hospitalier, Service de Microbiologie, University of Liège, Belgium

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Summary
Background: Two elderly people among a group of eight Belgian travellers who had stayed in Turkey for 2 weeks, developed a severe enteritis shortly after their return to Belgium. They had travelled by private bus, and had visited different places during their stay in Turkey from 6 to 17 September 2005.
Methods: After notification an epidemiological study was conducted by the Public Health authorities in Antwerp to identify the cause of the infection, to detect other cases, and to trace the source in Turkey. Vibrio cholerae was isolated from stools and a slide agglutination test was performed at the reference laboratory for cholera in Belgium.
Results: V. cholerae O1, El Tor, Inaba was identified in the stools of two patients. Four other patients, who suffered from a milder form of the disease, met the case definition of probable cases. No secondary infections among their contacts in Belgium were found. In spite of an epidemiological search conducted by the Turkish Public Health authorities, other cases of cholera in Turkey could not be detected. Nor a source for the outbreak could be established.
Conclusions: The outbreak of imported cholera in Belgium stresses the risk of contracting cholera in a country not considered as a cholera endemic region. It highlights the need for careful laboratory surveillance of intestinal infections in travellers after their return to their homeland. Early detection and prompt reporting are recommended.

Introduction
Cholera is an acute bacterial enteric disease caused by an infection with the bacterium Vibrio cholerae serogroup O1 or O139. V. cholerae O1 serogroup is subdivided into classical and El Tor biotypes, and two major serotypes, Inaba and Ogawa.
Cholera is characterized by the sudden onset of profuse, painless watery stools with occasional vomiting. The incubation period is usually 2–5 days, but may be only a few hours. In the absence of appropriate rehydration the degree of purging can lead to dehydration, metabolic acidosis and circulatory collapse in a matter of hours; with prompt treatment mortality is less than 1%. In vulnerable populations case fatality can be higher. Mild infections with moderate or asymptomatic presentation occur in 93% of persons infected with biotype El Tor.1,2,4

Cholera is endemic throughout many resource poor regions of the world. In 2004, 101,383 cases of cholera were reported to the World Health Organisation (WHO) from all continents except Oceania.4 According to the data of the WHO, Turkey is not on the list of countries with cholera-endemic areas and no cases of cholera from this country had been reported to the WHO since 1977.5,6 Imported cases of cholera in Belgium are extremely rare and a cluster of cases have been admitted to hospital immediately shortly after returning from Turkey. An epidemiological investigation by the Antwerp Health Inspectorate was started to characterize the strain of V. cholerae, collect epidemiological information, identify potential additional cases, trace the origin and coordinate required control measures.

Together with seven other Belgian tourists the index patient had participated in a 2-week journey in western Turkey. The eight travellers were aged between 58 and 68 with a mean age of 62. They visited different towns, stayed in well-equipped hotels and travelled by private bus. During their trip they were accompanied by a Belgian guide and a Turkish bus driver. After the flight from Brussels to Istanbul they visited Istanbul, Bursa, Ephesus, Aphrodisias, Pamukkale, Kusadasi, Antalya, Cappadocia, Ilhara and Ankara by bus. They also had lunch in different restaurants and picked up some food from markets and shops. The day before leaving Turkey by plane, they took an internal flight from Ankara to Istanbul. During that flight a salad was served.

Materials and methods

A confirmed case was a patient from whose stool or vomitus a toxinogenic V. cholerae O1 or O139 was isolated.9

A probable case was a clinically compatible case with an epidemiological link to a confirmed case and where the patient developed diarrhoea within 5 days after arrival in Belgium.9

V. cholerae was isolated from stools on XLD (xylose lysine desoxycholate) agar; on TCBS (thiosulphate citrate bile salts sucrose) selective medium for Vibrio species and on Campylobacter bloodfree selective medium. Vibrio species was suspected by biochemical characters (positive oxidase test and absence of lactose fermentation) and by motility.4 Identification of V. cholerae was confirmed by API 20E and Vitek 2® (bioMérieux). A slide agglutination test (Mast Diagnostic®) was performed at the reference laboratory for cholera in Belgium at the University Hospital of Liège.

The different travellers were interviewed and demographic, clinical and laboratory data were collected. Travelers were asked about specific exposure to beverages and about food consumption. Further case finding and source tracing were performed in Turkey by the Turkish public health authorities. Epidemiological investigation was carried out in facilities in Ankara and Nevsehir where the travellers had stayed during the period linked with the incubation period of the disease. The incubation period for cholera which was used was defined as a period varying from a few hours to 5 days.1 Samples were taken for bacteriological analysis of drinking water and stool samples were collected from restaurant and hotel staff in Turkey. Control measures in Belgium were applied according to the specific management procedures for cholera.10,11

Results

Out of eight travellers, six individuals developed symptoms of enteritis within 12 h from their return to Belgium. A 62-year-old female patient presented symptoms in the early evening of the day of return (17 September 2005). The syndrome was characterized by severe watery diarrhea without fever and accompanied by dehydration, metabolic acidosis and renal failure. The stool was positive for V. cholerae O1 El Tor. The patient had been treated before for an oncological problem followed by stomach surgery.

She was hospitalized for 4 days, treated with quinolones and she recovered completely. A second female patient of 68 years of age also showed symptoms of severe enteritis but she could be treated as an outpatient. The stool was also positive for V. cholerae O1, El Tor. She developed symptoms on 17 September as well. She was also treated with quinolones and recovered.

Four other patients, two males and two females, presented milder symptoms of the disease. They were treated symptomatically by their general practitioner. A stool analysis was only performed after recovery. All patients with symptoms recovered within four days. The travel guide and the bus driver who stayed in Turkey had no symptoms. No secondary cases could be detected among relatives in Belgium. The attack rate was 6/8 (75%) with a hospitalization rate of 1/8 (12.5%). A seventh traveller who developed diarrhoea a week after returning was excluded from the study.

Stool samples were provided by the seven travellers with intestinal complaints out of the eight tourists. Two patients with severe, watery diarrhea had a positive sample for V. cholerae. The slide agglutination reaction of the two isolations of V. cholerae was positive for V. cholerae O1, El Tor, Inaba. Control stool samples from these two patients after treatment were negative. All the control samples provided after treatment by five patients with less severe diarrhoea were negative.

An investigation among hotel and restaurant staff in Turkey revealed no other cases. No cases were detected by the Turkish surveillance system for communicable diseases. The tourists consumed meals and food in different hotels and bought food in markets and street shops. Fruit, vegetables, poultry, meat, rice and beverages were ingested. No seafood was consumed. The drinking water in the hotels was originally packed and bottled and no pathogenic
factors were found in the analysis. The food storage, preparation and cooking areas of the hotels and restaurants were operated hygienically and staff health checks were carried out on a regular basis. After a warning from the WHO, active surveillance was started by the Turkish health authorities in hospitals in Turkey. No cases of cholera were identified and no source of infection could be established.

Discussion

Six out of a group of eight elderly Belgian tourists developed cholera after returning from a journey in Turkey. V. cholerae O1, El Tor, Inaba were identified in the stools of two of the patients with severe disease. Four patients with a less severe clinical syndrome but with the same onset of the disease were considered as probable cases. Case finding in Turkey and Belgium revealed no other clinical cases.

Despite careful investigation the specific source of the outbreak could not be established. The incubation period of cholera and the simultaneous onset of the epidemic offered arguments for the hypothesis that the infection was linked to the latter part of the journey, including the flight from Ankara to Istanbul. However, the follow up study revealed no other cases in Turkey and no presence of pathogenic agents in drinking water, food or staff in the facilities where the travellers had stayed. Although active surveillance was carried out, no other cases were detected or reported by the cholera surveillance network in Turkey. However, no cases of cholera had been reported from Turkey to WHO since 1977.6,7 In Denmark in 1994 an imported cholera case was also identified after travel to Turkey.8 Considerable underestimates of cholera are well known in different parts and different countries in the world.4,13,14 Routine culture of stool samples for V. cholerae is often not done or not available and some affected countries may not report cases because of concerns about their impact on the travel industry.4 Asymptomatic and mild cholera may also remain undetected.15 Although cases of cholera were identified in the vicinity of Turkey, in Tajikistan and Afghanistan, no cases were isolated or reported in Turkey.15-17 The findings in this study stress the hidden risk for travellers even in cholera free countries, especially if food is bought in markets and bars. The study highlights the need for individual prevention measures for travellers. Vaccination against cholera may be considered for vulnerable persons but, so far systematic vaccination of travellers in Turkey against cholera has not been recommended.4 Given the low risk of cholera for travellers, imported cases of cholera in Belgium are quite rare. The last case dates from 2004 when an Indian 43-year-old female was hospitalized when she developed cholera a day after leaving India.

The data suggest that there is extra risk for elderly people with known or unknown medical problems. One of the patients who developed a full-blown cholera syndrome, had an oncological problem and had formerly had a surgical intervention on the stomach resulting in hypochlorhydria. Alteration of gastric barrier diminishes the infecting dose which is known to be rather high in people with normal gastric acidity.18 A number of 108–1011 are needed to establish infection.4 Under diagnosis is also a problem in Belgium where reimbursement of stool analysis is limited to the identification of the four common intestinal pathogens i.e. Salmonella, Shigella, Campylobacter and Yersinia. This may result in a structural under identification of less prevalent pathogens like V. cholerae. Further, biochemical testing of suspected bacteria and the eventually use of selective media are essential.

In conclusion, cholera remains a disease of great public health importance. Prevention is essential. New oral cholera vaccines promise substantial protection without side effects.2 Identification of regions at risk and vaccination of travellers with specific risk factors could be considered as part of prevention. Early detection of cases and outbreaks and effective surveillance can also contribute to a precise identification of countries of risk.

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References

